Amendments to the Claims

1-7. (Canceled)

8. (Previously Presented) An off-line diagnosis system comprising:

a field instrument for use in a process control system, the instrument having capability to perform, during an off-line interval, a diagnosis function over a signal input range, wherein the diagnosis function is one of a self-diagnosis function and a valve diagnosis function, and the signal input range is divided into a plurality of zones with respect to an input axis or a time axis; and

a host application in digital communication with the field instrument, wherein diagnosis results of each zone are successively transmitted to the host application.

9. (Previously Presented) The system of claim 8, wherein the field instrument comprises memory of a predetermined capacity having diagnosis results of one zone stored therein, and the field instrument is adapted to transmit to the host application diagnosis results of the one zone while storing in memory diagnosis results of another zone.

10. (Previously Presented) The system of claim 8, wherein the diagnosis function is based on input-output characteristics measurement, wherein an input is given to the object being diagnosed and then an output value thereof is measured.

11. (Previously Presented) The system of claim 8, wherein the diagnosis is based on a step input given to the object being diagnosed.

12. (Previously Presented) The system of claim 8, wherein the field instrument is a valve positioner.

13. (Previously Presented) The system of claim 8, wherein the field instrument is an electro-pneumatic converter.

14. (Previously Presented) A diagnosis system comprising:

a field instrument for use in a process control system, the instrument adapted to perform a diagnosis function during an off-line interval including dividing a signal input range into a plurality of zones with respect to a time axis and successively measuring diagnosis results for each zone; and

a host application digitally coupled to the field instrument to receive the diagnosis results for each zone of the plurality of zones, wherein the field instrument successively communicates diagnosis results for each zone to the host application.

15. (Previously Presented) The system of claim 14, wherein the field instrument comprises memory having maximum capacity for a predetermined number of data measurement points and the number of data points measured for each zone equal the predetermined number.

16. (Previously Presented) The system of claim 14, wherein the field instrument is a valve positioner.

17. (Previously Presented) The system of claim 14, wherein the field instrument is an electro-pneumatic converter.

18. (Previously Presented) The system of claim 14, wherein the diagnosis function is a self-diagnosis function.

19. (Previously Presented) The system of claim 14, wherein the diagnosis function is a valve diagnosis.

20. (Previously Presented) A method of improving diagnosis resolution in a field instrument of a process control, the method comprising:

dividing a signal input range into a plurality of zones with respect to an input axis or a time axis;

measuring with the field instrument input response characteristics for each zone, including storing data point measurements for each zone in memory of a predetermined capacity of the field instrument; and

successively communicating the data point measurements for each zone to memory of a host application in digital communication with the field instrument, wherein the number of data point measurements communicated to the host application is greater than the capacity of the memory of the field instrument.

21. (Previously Presented) The method of claim 20, wherein measuring input response characteristics comprises measuring step input characteristics.

22. (Amended) A method of improving diagnosis resolution in a field instrument of a process control, the method comprising:

dividing a signal input range into a plurality of zones with respect to an input axis or a time axis;

measuring input response characteristics for a zone with the field instrument;

storing measurement data points for the zone in memory of the field instrument;

transmitting the measurement data points for the zone to a host application; and

while transmitting the measurement data points for the zone, measuring input response characteristics for a ~~successive~~ second zone with the field instrument.

23. (Previously Presented) The method of claim 22, comprising successively transmitting the data measurement points for all the plurality of zones to the host application.

24. (Previously Presented) A method of performing a valve diagnosis with a valve positioner, comprising:

dividing a signal input range into a plurality of zones with respect to a time axis;

measuring input response characteristics for each zone with the valve positioner;

successively storing data point measurements for each zone in memory of the valve positioner; and

successively communicating the data point measurements for each zone to memory of a host application in digital communication with the valve positioner.

25. (Previously Presented) A method of performing a self-diagnosis with a valve positioner, comprising:

dividing a signal input range into a plurality of zones with respect to a time axis;

measuring input response characteristics for each zone with the valve positioning; and

successively storing and communicating data point measurements for each zone to memory of a host application, wherein the valve positioner transmits the data point measurements for one of the plurality of zones to the host application while measuring the data points for a successive zone of the plurality of zones.